TITAN

Micro

X.21, V.35, 2M, 2M-40dB

Operator Manual
Software Description

AVT Audio
Video
Technologies

T A B L E   O F   C O N T E N T S

1 SAFETY

The unit described is designed against the latest technical parameters and complies with all national and international safety requirements. It operates with a high level of operational safety resulting from long development experience and stringent quality control in our company.

In normal operation this equipment is safe.

There are, however, some potential sources of danger that cannot be completely eliminated.

This Operator Manual therefore contains basic safety instructions that must be observed during system configuration and operation. This Operator Manual must be read before the system is used and the current version of the document must always be kept close to the equipment.

All safety instructions have a uniform appearance. This appearance is described in detail in CHAP. 1.2 .

1.1 General Safety Requirements

In order to keep the technically unavoidable residual risk to a minimum, it is imperative to observe the following rules:

- Transport, storage and operation of the unit/system must be under the permissible conditions only.

- Installation, configuration and disassembly must be carried out only by expert personnel and with reference to the respective documentation.

- The system must be operated by expert and authorised users only.

- The system must not be operated unless it is in perfect working order.

- Any conversions or changes to the system or parts of the system (including the software) must be carried out by qualified personnel from our company or by expert personnel authorised by our company.
  All changes carried out by other persons lead to a complete exemption from liability.

- The removal or disabling of safety facilities, the clearing of faults and errors, and the maintenance of the equipment must be carried out by specially qualified personnel only.

- Non-system software is used at one´s own risk. The use/installation of non-system software can adversely affect the normal functioning of the system software.

- Only use tested and virus-free data carriers!

1.2 Appearance of the safety instructions

All safety instructions include a signal word that classifies the danger and a text block that contains descriptions of the type and cause of the danger, the consequences of ignoring the safety instruction and the measures that can be

taken to minimise the danger. In some safety instructions, a warning symbol is placed underneath the signal word (see also CHAP. 1.2.2):

Signal word   **Type and cause of danger**

                  Possible Consequences of ignoring the safety instruction

                  Measures to minimise the danger

1.2.1 Classification of safety instructions

There are five classes of safety instructions: "Danger", "Warning", "Caution", "Notice" and "Important". The classification is shown in the following table.

Signal word \ Result	Death			Serious injury			Minor injury			Material damage[1]			Fault[2]		
	definite	likely	possible	definite	likely	possible	definite	likely	possible	definite	likely	possible	definite	likely	possible
DANGER[3]	▨	▨		▨	▨										
WARNiNG			■			■									
CAUTION							■	■	■	■	■				
NOTICE											■	■			
IMPORTANT													■	■	■

The signal word "Note" is also used in the Operator Manual. Text passages marked in this way do not describe a danger, but rather contain reminders, tips and general information to ensure optimum operation of the system.

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[1] Damage to product or product environment

[2] Considerable impairment to operation

[3] This danger class is not required for TITAN Micro

1.2.2 Warning symbols

The following warning symbols are used:

Symbol	Meaning
	General warning about a danger
	Warning about a dangerous electrical voltage

The safety instructions classified "Danger", "Warning" and "Caution" always include a warning symbol. "Notice" and "Important" safety instructions sometimes include a warning symbol.

2   INTRODUCTION

The TITAN *Micro* units can be equipped with X.21 or V.35 or 2-Mbit/s Interface units. The TITAN *Micro* X.21 and V.35 can be used for the transmission of full-motion pictures at bit rates from 64-kbit/s to 1024-kbit/s in steps of 64-kbit/s. TITAN *Micro* 2M can occupy up to 16 x 64-kbit/s time slots (1024-kbit/s) of the 30 possible time slots (1920-kbit/s) for coded data of full-motion pictures. In the multi mode a few TITAN Micro 2M units can be daisy chained. In each TITAN Micro 2M the occupied Time slots must be configured. The used coding algorithm meets the requirements of ITU-T Recommendation H.261. In addition TITAN *Micro* contains 4 x TTL inputs and outputs and also an electrically decoupled input and output.

The TITAN *Micro* units are designed as an Encoder or Decoder. Both types of units are described in this Operator Manual.

3 SYSTEM DESCRIPTION

3.1 Mechanical Design

The TITAN *Micro* consists of two boards which are mounted in a housing with the dimensions (W x H x D) 182 mm x 57 mm x 165 mm and a plug top power supply. TITAN *Micro* can be installed as a table top unit or, using the option "19" adapter" in 19" racks. The "19" adapter" can be equipped with two TITAN Micro units. Sufficient ventilation is ensured by ventilation holes located at the rear and the sides of the housing.

Figure 1 shows the rear view of the TITAN *Micro* X.21/V.35, Figure 2 shows the rear view of the TITAN *Micro* 2M .
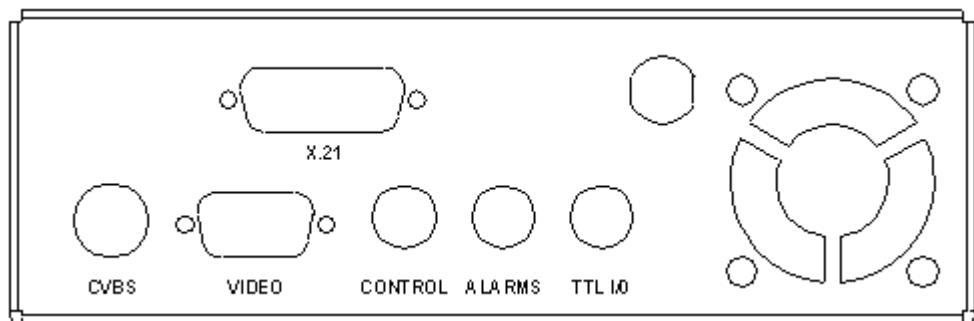
Figure 1: Rear view of TITAN *Micro* X.21/V.35
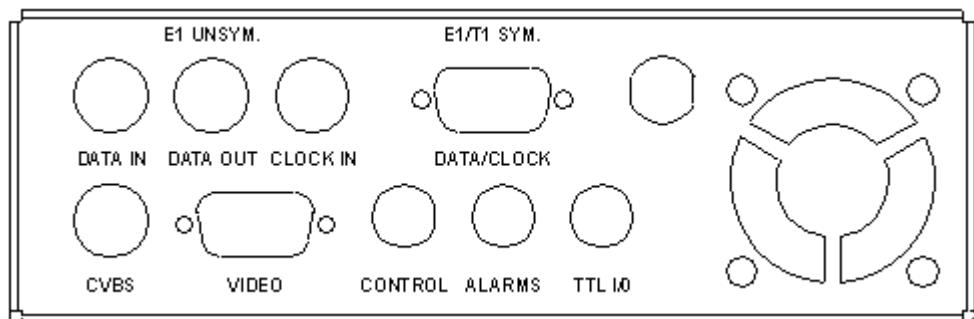
Figure 2: Rear view of TITAN *Micro* 2M

The TITAN *Micro* will be powered by a plug top power supply unit. The plug top power supply unit of TITAN Micro can be powered with AC voltages between 198V and 264V   (nominal voltage range 230-240V). The mains frequency can also vary between 40 and 70 Hz. The maximum power consumption is approx. 38 W. One fan has been built in for cooling purposes. The fan generates a minimum of noise. The equipment also has 3 LEDs on the front panel which are used for status indication of the system. The configuration of the system will be done by a PC via the control Interface (RS232) at the rear side of the unit.

3.2 Functionality

The TITAN *Micro* incorporates a video encoder or video decoder and a network interface circuit. The TITAN *Micro* X.21 is equipped with a X.21 network interface board. TITAN *Micro* V.35 incorporates a V.35 network interface board whereas the TITAN *Micro* 2M consists of a 2-Mbit/s/T1 network interface board according to ITU-T Rec. G.703/G.704.

Functionality of the basic board:

- Encoding of full-motion pictures (encoder) according to ITU Rec H.261: FCIF resolution (Full Common Intermediate Format) has been implemented. This format supports a frame rate of 15 Hz

- Decoding of full-motion pictures (decoder) according to ITU Rec. H.261

- 4 TTL signal inputs and a electrically decoupled signal input for local control

Functionality of the X.21 network interface board:

- X.21 network access

- Generation of data rates of 64-kbit/s ... 1024-kbit/s

Functionality of the V.35 network interface board:

- V.35 network access

- Generation of data rates of 64-kbit/s ... 1024-kbit/s

Functionality of the 2-Mbit/s/T1 network interface board:

- 2-Mbit/s/T1 network access according to ITU -T Rec. G.703

- Multiplexing according to ITU-T Rec. G.704

- Regeneration of the received network signal and clock generation

- Regenerator capability with 40dB sensitivity

3.3 Functionality of the video encoder

The video encoder meets the requirements of ITU-T Rec. H.261. The higher resolution picture format FCIF (Full Common Intermediate Format) has been implemented. This format is supported up to a frame rate of 15 Hz.

CVBS or Y/C signals can be used as input signals. For CVBS signals, the video standards PAL and NTSC will be supported. Genlock outputs are provided for the synchronisation of connected cameras.

The sockets for the video inputs of the video encoder TITAN *Micro* can be assigned to various signal types. There are five video input modes available for this purpose. These are shown in TABLE 3.1 .

TABLE 3.1 POSSIBLE INPUT SIGNALS FOR THE VIDEO INPUT MODE					
CVBS1	CVBS2	CVBS3	CVBS4	Y/C 1	Y/C 2
+	-	-	-	-	-
+	+	+	+	-	-
+	+	-	-	+	-
-	-	+	+	-	+
-	-	-	-	+	+

3.4 Functionality of the video decoder

The video decoder meets also the requirements of ITU-T Rec. H.261. It decodes the picture format FCIF at a maximum frame rate of 15 Hz.

CVBS and Y/C or RGB signals are provided at the output. For the CVBS signal, the video standards PAL and NTSC can be selected. For the video outputs, there are two different modes available. These are shown in TABLE 3.2. The available Genlock inputs allow a remote synchronisation of the video decoder.

TABLE3.2: POSSIBLE OUTPUT SIGNALS FOR THE VIDEO OUTPUT MODE		
CVBS	Y/C	RGB, Sync.
+	+	-
+	-	+

3.5 Functionality of the X.21 interface board

This interface board contains the X.21 interface circuits including transmitter and receiver components. The X.21 interface is available at the rear side of the unit. The X.21 interface allows access to transmission networks and is a data interface with bit clock. The interface can operate from 64-kbit/s up to 1024-kbit/s in 64-kbit/s steps.

This is a DTE (Data Terminal Equipment) interface which requires as a transport medium a line in which the data is switched en bloc.

3.6 Functionality of the V.35 interface board

This interface board contains the V.35 interface circuits including transmitter and receiver components. The V.35 interface is available at the rear side of the unit. The V.35 interface allows access to transmission networks and is a data interface with separate bit clocks for receive and transmit data. The interface can operate from 64-kbit/s up to 1024-kbit/s in 64-kbit/s steps.

This is a DTE (Data Terminal Equipment) interface which requires as a transport medium a line in which the data is switched en bloc.

3.7 Functionality of the 2-Mbit/s/T1 interface board

This interface board contains the complete 2-Mbit/s and T1 interface circuits including transmitter, receiver and further control components. The signal is HDB3 coded and complies with ITU-T Rec. G.703. The multiplex structure of the signal is implemented according to ITU-T Rec. G.704. A multiplex frame of the 2-Mbit/s signal consists of 32 time slots and a T1 frame of 24 time slots with a data rate of 64-kbit/s per time slot. Time slot 0 contains alternately the frame alignment signal and the service digits. The frame alignment signal is for synchronisation, the service digits transmit alarms to the remote end.

Two different formats have been defined for the 2-Mbit/s data stream:

- the double-frame format
- the CRC4-frame format

In the CRC4 -frame format, a so-called check bit is transmitted as the first bit of the frame alignment word.

16 time slots of the available 30 time slots at E1 or 24 time slots at T1 can be filled with coded video data.

The TITAN *Micro* 2M-40dB includes a regenerator circuit with 40 dB sensitivity.

4 PUTTING THE SYSTEM INTO OPERATION

4.1 Mounting

With its dimensions (W x H x D) of 182 mm x 57 mm x 165 mm the TITAN *Micro* can be operated as a table-top device or, be inserted into 19" racks using a 19" adapter.

The dimensions given above are valid for the table-top version with no feet. If the TITAN *Micro* is to be inserted into a rack, it should be remembered that the bending radius of the cables should always be greater than the minimum allowed value.

If the TITAN *Micro* is installed in a rack, it should also be ensured that sufficient ventilation is provided. It is recommended that at least 1 cm space is left next to the openings. As rule, the ambient temperature should not lie outside the range +5°C to +40°C. These limits are of particular importance if the system is inserted in a rack.

During operation, the humidity must lie between 5% and 85%.

NOTICE	Incorrect ambient temperature and humidity can lead to equipment failure
⚠	Operation of the unit outside the above limits invalidates the warranty.
	The TITAN *Micro* X.21 must therefore be operated within the specified limits.

4.2 Connection to the mains voltage

The plug top power supply unit of the TITAN *Micro* can be operated with a voltage (mains) between 198 V and 264 V. The mains frequency can vary between 40 Hz and 70 Hz. The power consumption is a maximum of approx. 35 W.

After putting the plug top power supply unit into operation, all three LEDs should light up for a time period of approx. 1 second. A internal reset is then triggered. This is indicated by switched off LEDs. After approximately twenty seconds, the unit is operational and the green "Power" LED should light up.

4.3 Signalling LEDs

There are three LEDs for signalling on the TITAN *Micro* (see Figure 3):

- Power   green
  Lights up when system is ready for operation.

- Connect   yellow
  Lights up if a connection is established.

- Alarm: red
  Lights up if a fault has occurred in the unit.

Figure 3: Front view of TITAN *Micro*

4.4 Configuration overview

This chapter shall give an overview of the configuration of the system. Detailed instructions are described in the following chapters.

1. Connection of a video source to the video encoder and of monitors to the video decoder

2. Connection of the unit to the transmission network (X.21, V.35 or 2-Mbit/s or T1)

3. Loading of the Windows application software „TITAN *Micro*" (see chapter. 5.3) and configuration of the PC (see chapter 5.5.1)

4. Configuration of the video encoder

5. Configuration of the video decoder

6. Entering of a "connect" command via PC to the Video encoder or video decoder.

7. Checking the establishing of the connection.

5 OPERATION WITH A PC

The Windows control software „TITAN *Micro*" allows a simple configuration and control of the system .

5.1 Hardware requirements

The PC must fulfil the following minimum requirements:

- IBM PC AT, IBM PS/2 or 100% compatible

- Windows 3.1/Windows 95

- approx. 600 kByte free conventional memory

- approx. 1,5 MB free hard-disk memory

- IBM VGA graphics board (display adapter) with 800 x 600 pixels

- a free serial interface RS-232

- *Micro*soft, IBM PS/2 or 100% software-compatible mouse

5.2 Connection of the TITAN *Micro* to the PC

Connect the PC serial interface to the CONTROL (RS232C) interface on the rear panel of the TITAN *Micro*. Use the delivered cable (8-pin Mini DIN to 9-pin D-Submin cable).

The serial interface of TITAN *Micro* (RS232C) is configured in accordance with the following parameters by the factory:

- String Commands

- 19200 Baud

- 8 data bits

- no parity

The TITAN *Micro* can now be controlled from the PC.

5.3 Installation of the software on the PC

For the installation [1] of the software on the PC, please place the disk in the drive of the PC. Then start the installation under Windows 95 by selecting the **START button** and selecting the sub menu item **Ausführen...**. Insert into the command line

      a:setup

and select OK button. If your disk drive is not "a", use the corresponding designation in place of "a", Now follow the remarks of the installation program and use the recommended directory. As proposed please install a new program

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[1] Please make a backup copy of the original disk before installation.

group „Titan *Micro*". In this program group you will find later the symbol for starting the program as well as a possibility for de-installation of the program.

After successful installation you will find now under **START → PROGRAMME →TITAN *Micro*: p**rogram symbol ![AVT Titan Micro Commander icon] for starting the TITAN *Micro* software.

For de-installation select the ![de-installation icon] symbol

5.4 Main panel TITAN *Micro* Commander

After starting the software the user will get displayed the main panel. Depending on the connected TITAN *Micro* unit (TITAN *Micro* X.21 or TITAN *Micro* V.35 or TITAN *Micro* 2M and Encoder or Decoder) different graphical user interfaces will be displayed.

5.4.1 Main panel TITAN *Micro* X.21 and V.35

All necessary settings for encoder and decoder will be indicated in different panels. The difference between the TITAN *Micro* X.21 and TITAN *Micro* V.35 panels is only the display of the product name.

5.4.1.1 Main panel TITAN *Micro* X.21/V.35 Encoder

Figure 4: Main panel TITAN *Micro* X.21/V.35 Encoder
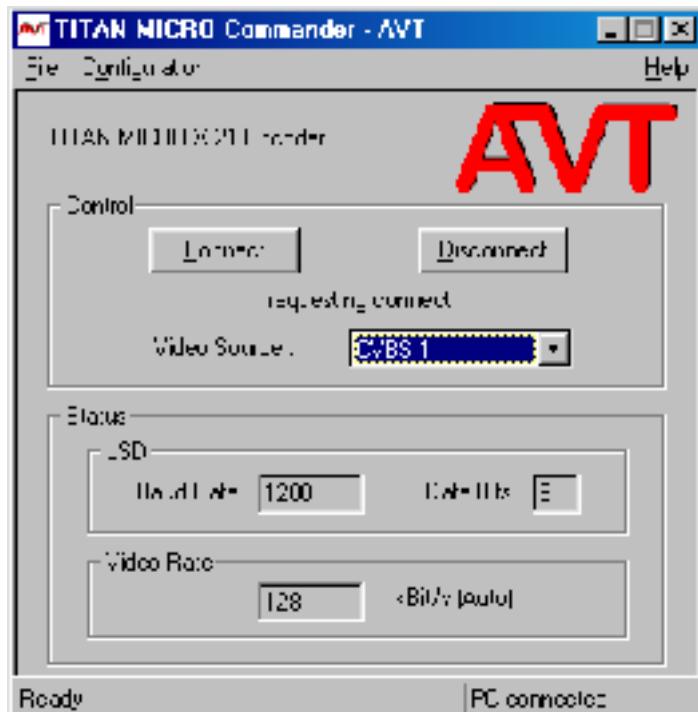
- The **Control** field contains the status of the connection

- The field *Video Source* displays the selected video source. With the down arrow the video source can be selected.

- *Connect* or *Disconnect* button for connecting and disconnecting to the network.

- *LSD* channel is a unidirectional data channel from decoder to encoder.

- *Video Rate* describes the X.21 or V.35 data rate

5.4.1.2 Main panel TITAN *Micro* X.21/V.35 Decoder

Figure 5: Main panel TITAN *Micro* X.21/V.35 Decoder
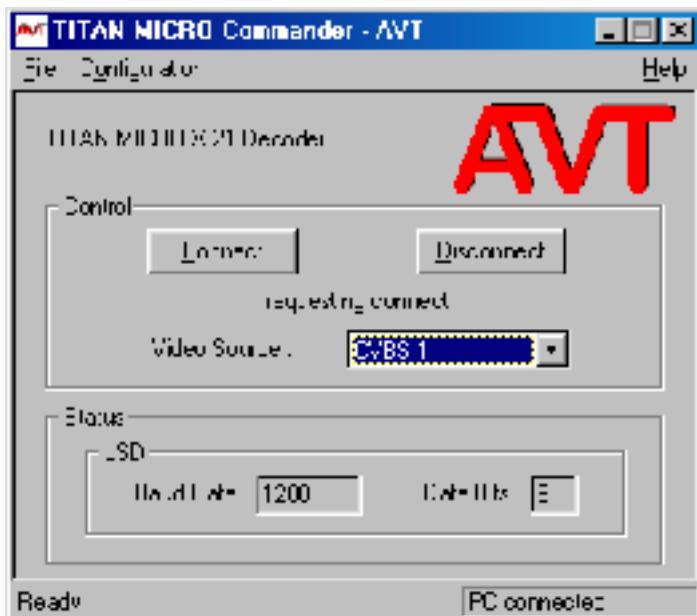
- The *Control* Field contains the status of the connection

- The field *Video Source* displays the selected video source. With the down arrow the video source can be selected.

- *Connect* or *Disconnect* Button for connecting and disconnecting to the network.

- *LSD* channel is a unidirectional data channel from decoder to encoder.

5.4.2 Main panel TITAN *Micro* 2M

In addition to the configuration parameters of the encoder and decoder also the 2-Mbit/s/T1 line alarms will be indicated.
The following are displayed:

- Signal   connection exists
- Sync   system is synchronised
- AIS   AIS signal received
- Clock   external clock signal received
- Local N-Alarm   local deferred maintenance (non-urgent) alarm
- Local D-Alarm   local prompt maintenance (urgent) alarm
- Remote N-Alarm   deferred alarm on the remote side
- Remote D-Alarm   prompt alarm on the remote side

5.4.2.1 Main panel TITAN *Micro* 2M Encoder

**Figure 6: Main panel TITAN *Micro* 2M Encoder**
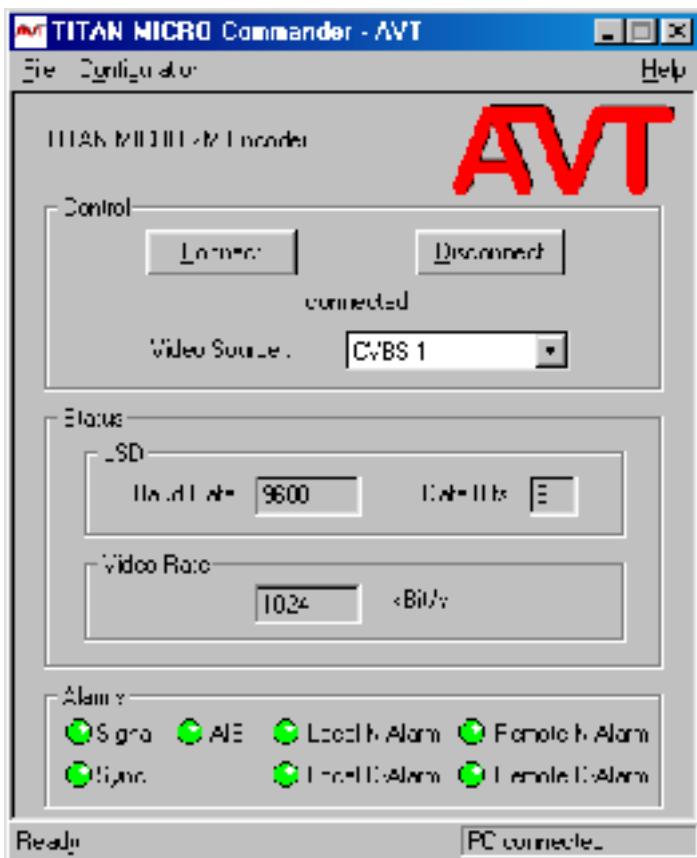
- The **Control** Field contains the status of the connection

- The field *Video Source* displays the selected video source. With the down arrow the video source can be selected.

- *Video Rate* describes the number of used time slots.

- **Connect** or **Disconnect** Button for connecting and disconnecting to the network.

- **LSD** channel is a bi-directional data channel between decoder and encoder.

- The **Alarms** Field shows the 2-Mbit/s/T1 alarm messages

5.4.2.2 Main panel TITAN *Micro* 2M Decoder

Figure 7: Main panel TITAN *Micro* 2M Decoder
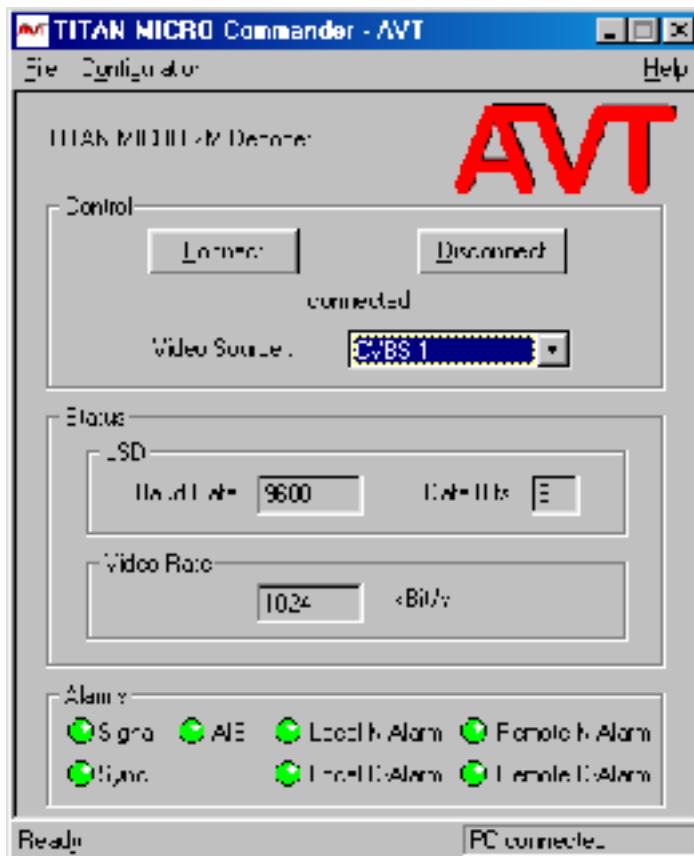
- The **Control** Field contains the status of the connection

- The field *Video Source* displays the selected video source. With the down arrow the video source can be selected.

- **Video Rate** describes the number of used time slots.

- **Connect** or **Disconnect** Button for connecting and disconnecting to the network.

- **LSD** channel is a unidirectional data channel from decoder to encoder.

- The **Alarms** Field shows the 2-Mbit/s/T1 alarm messages

5.5 Menu Configuration

After selection of the menu item **Configuration** the choices for the configuration of the system will be displayed. Selected can be
- COM Port

- Titan *Micro* (X.21 or V.35 or 2M or T1 automatic via hardware configuration)

- Two Button Mode

- System Panel

- Software Download

5.5.1 Sub menu COM Port

After selection of the sub menu item **COM-Port** a window for the selection and configuration of the COM interface of the PC opens. If the selected COM port is already occupied an error message will be displayed. Then select another open COM port. For the Baud rate always select 19200 Baud.

Figure 8: Sub menu COM-Port
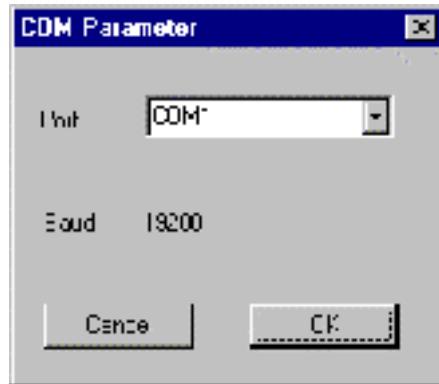
5.5.2 Sub menu TITAN *Micro*

In the sub menu **TITAN *Micro*** the units TITAN *Micro* X.21 , V.35 or TITAN *Micro* 2M can be configured. Dependent on the equipped interface board of TITAN *Micro* the sub menus of TITAN *Micro* X.21 or TITAN *Micro* V.35 or TITAN *Micro* 2M will be automatically displayed. There are separate menu items for encoder and decoder of TITAN *Micro*.

5.5.2.1 Sub menu TITAN *Micro* X.21 and V.35 Encoder

There can be displayed 3 different panels: Video, Data and Line.
The configuration will be saved selecting the button "Save on Board".
The commands "Set" and "OK" only cause the transmission of the configuration from the PC to the TITAN *Micro* but does not store the configuration on the TITAN *Micro*. The command "OK" also closes the window of the PC software.
If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return

5.5.2.1.1 Sub Menu TITAN Micro X.21 and V.35 Enc., Video Panel

The video inputs can be configured (CVBS 1...4 or Y/C 1, 2) and the actual video source (Current Video Source) can be set as one of the configured video inputs. Further the quality of the coded video picture can be defined (sharpness versus motion). The video standard can be selected as PAL or NTSC.

Figure 9:Sub menu TITAN *Micro* X.21/V.35 Enc., Video Panel
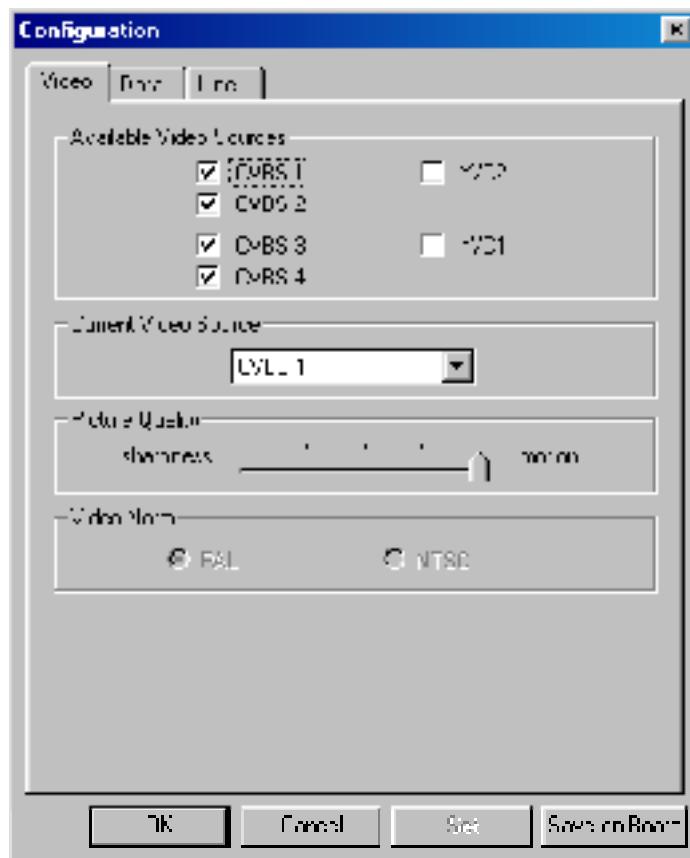
5.5.2.1.2 Sub Menu TITAN Micro X.21 and V.35 Enc., Data Panel

The TTL interface can be configured in 4 different modes for local and remote control capability. For this purpose the following settings of the "TTL I/O Mode" field are possible: "off" (no function), "transparent" (allows the remote control capability from the decoder) , "CVBS select" (local control of the CVBS camera inputs via Pin 1 and 2) or "Y/C select" (local control of the Y/C camera inputs via Pin 1) and "CVBS select, connect via TTL in 3" (in addition to the local control of the CVBS camera inputs via Pin 1 and 2, connect and disconnect of the line via TTL Pin 3).
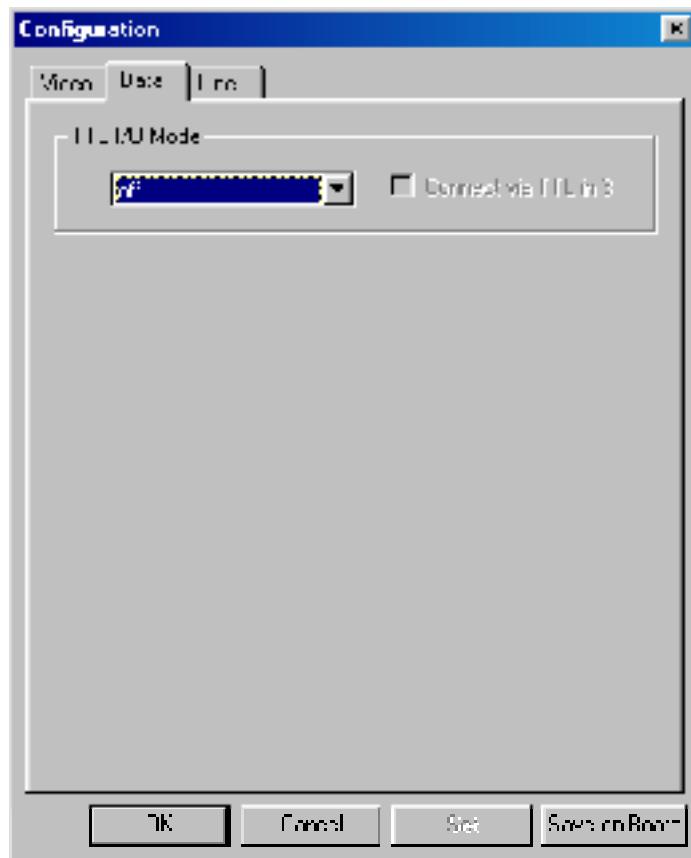
5.5.2.1.3 Sub Menu TITAN Micro X.21 and V.35 Enc., Line Panel

In this sub menu the data rate of the encoder can be set. This selected data rate has to be identical with the X.21 and V.35 data rate. Data rates of (1 ... 16) x 64-kbit/s can be chosen. If the value "Auto" is selected, the unit measures the clock at the X.21 or V.35 interface and adapts automatically to the received data rate.

If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return

Figure 11: Sub menu TITAN *Micro* X.21/V.35 Enc.,Line Panel
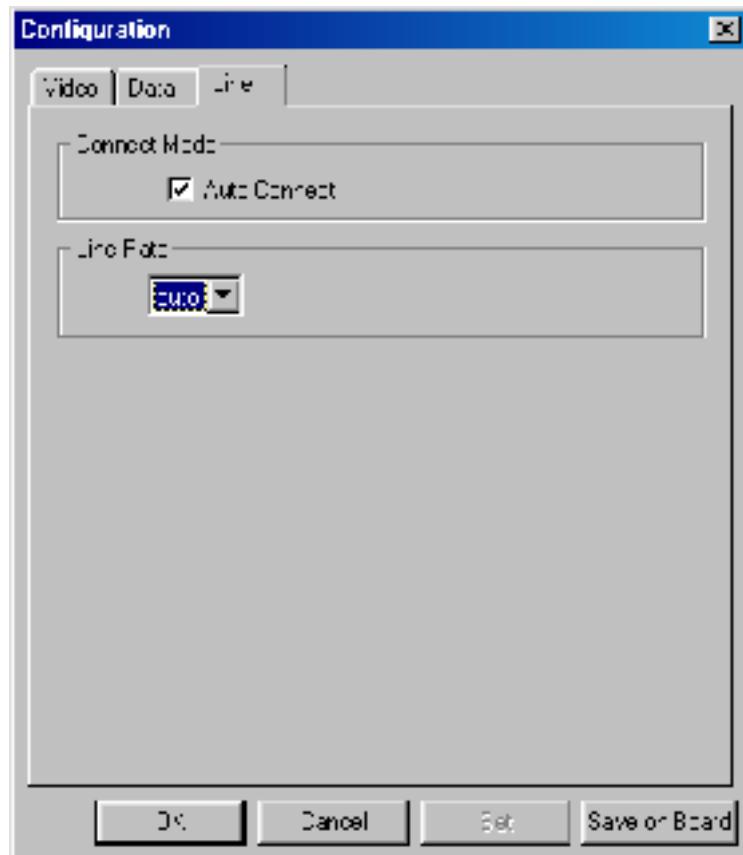
5.5.2.2 Sub menu TITAN Micro X.21 and V.35 Decoder

There can be displayed 4 different panels: Video, Data, Line and OSD.
The configuration will be saved selecting the button "Save on Board".
The commands "Set" and "OK" only cause the transmission of the configuration from the PC to the TITAN *Micro* but does not store the configuration on the TITAN *Micro*. The command "OK" also closes the window of the PC software.
If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return

5.5.2.2.1 Sub menu TITAN *Micro* X.21/V.35 Dec., Video Panel

The video output combinations Y/C+CVBS or RGBSyn+CVBS can be selected. Via remote control the video inputs of the Encoder can be configured (CVBS 1...4 or Y/C 1, 2) and the quality of the coded video picture can be defined (sharpness versus motion). The video standard can be selected as PAL or NTSC. The camera inputs can be switched in a cyclic mode activating the field "Cyclic Camera Switch". The switching period can be defined in field "Switch Time".

5.5.2.2.2 Sub menu TITAN Micro X.21 and V.35 Dec., Data Panel

The LSD data rate of the unidirectional data channel in the direction from decoder → encoder can be set. Available data rates are 1200 Baud, 2400 Baud, 4800 Baud or 9600 Baud. The TTL interface can be configured in 4 different modes for remote control of the Encoder. For this purpose the following settings of the "TTL I/O Mode" field are possible: "off" (no function), "transparent" (transparent transmission of the status of the TTL inputs at the Decoder to the Encoder), "CVBS select" (remote control of the CVBS camera inputs via Pin 1 and 2) or "Y/C select" (remote control of the Y/C camera inputs via Pin 1) and "CVBS select, connect via TTL in 3" (in addition to the remote control of the CVBS camera inputs via Pin 1 and 2, local connect and disconnect of the line via TTL Pin 3).

5.5.2.2.3 Sub menu TITAN Micro X.21 and V.35 Dec., Line Panel

If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return.

Figure 14: Sub menu TITAN *Micro* X.21/V.35 Dec. Line Panel
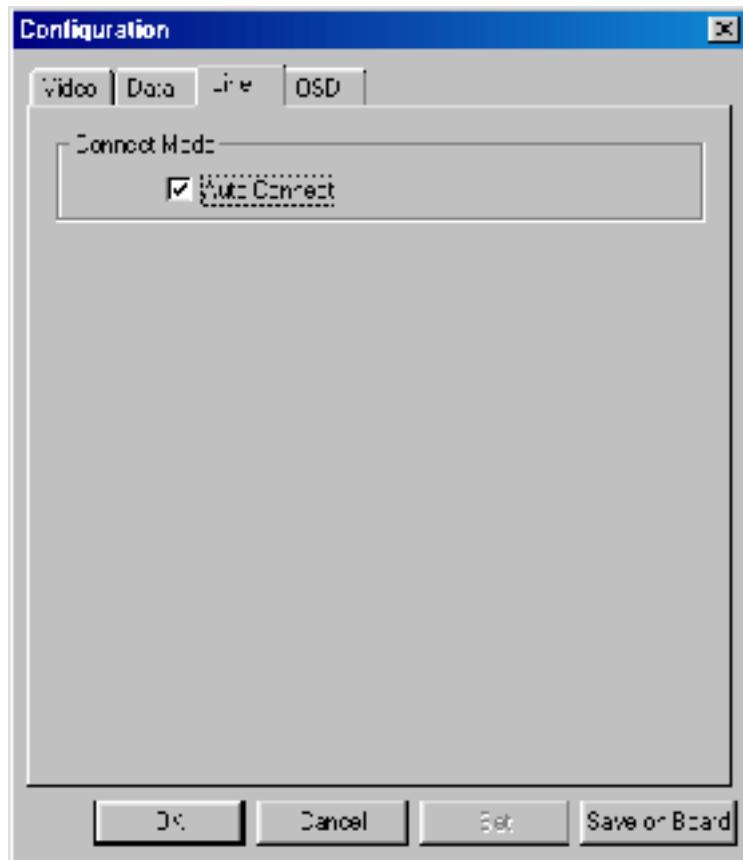
5.5.2.2.4 Sub menu TITAN Micro X.21 and V.35 Dec., OSD Panel

Field "Time/Date" allows the selection of the clock function and also the setting of the clock. In the field "OSD Mode" fixed symbols and self defined characters for the selected camera can be displayed in the decoded picture. Also strings can be defined by the user and can be indicated in the decoded picture.
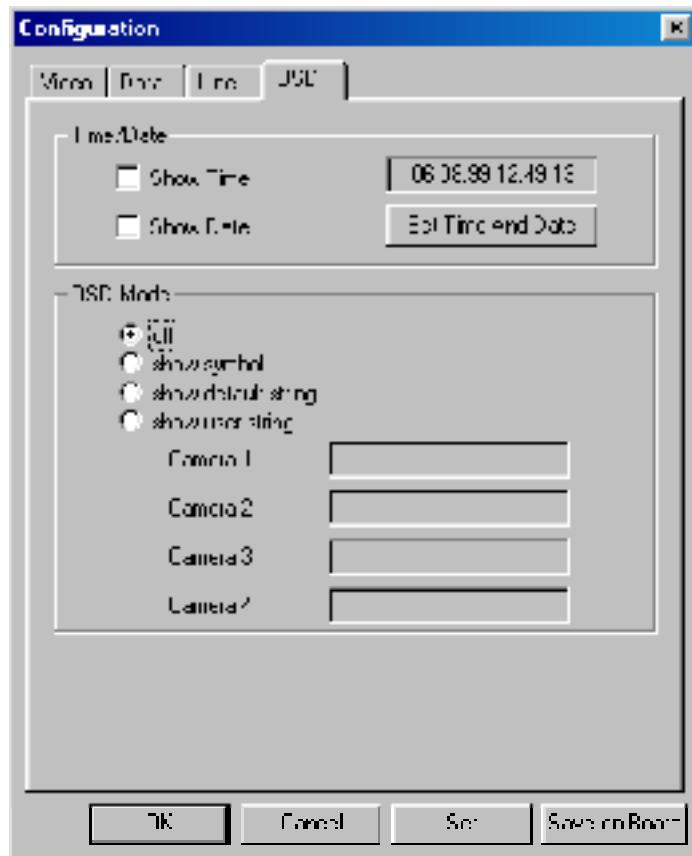
5.5.2.3 Sub menu TITAN *Micro* 2M, Encoder

There can be displayed 3 different panels: Video, Data and Line.
The configuration will be saved selecting the button "Save on Board".
The commands "Set" and "OK" only cause the transmission of the configuration from the PC to the TITAN Micro but does not store the configuration on the TITAN Micro. The command "OK" also closes the window of the PC software.
If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return

5.5.2.3.1 Sub menu TITAN Micro 2M Enc., Video Panel

The video inputs can be configured (CVBS 1...4 or Y/C 1, 2) and the actual video source (Current Video Source) can be set as one of the configured video inputs. Further the quality of the coded video picture can be defined (sharpness versus motion). The video standard can be selected as PAL or NTSC.

Figure 16: Sub menu TITAN Micro 2M Enc., Video Panel
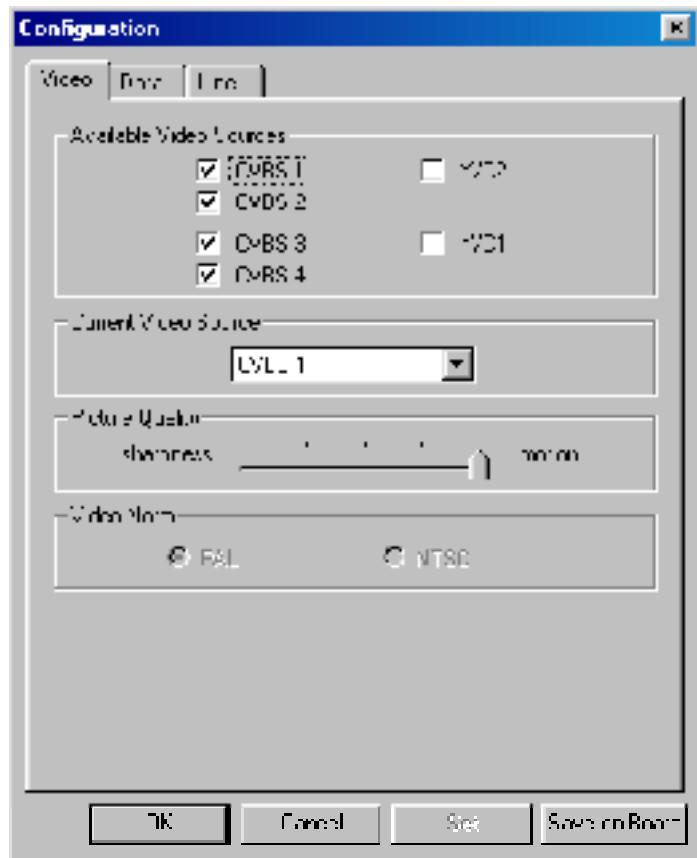
5.5.2.3.2 Sub menu TITAN Micro 2M Enc., Data Panel

The TTL interface can be configured in 4 different modes for local and remote control capability. For this purpose the following settings of the "TTL I/O Mode" field are possible: "off" (no function), "transparent" (allows the remote control capability from the decoder) , "CVBS select" (local control of the CVBS camera inputs via Pin 1 and 2) or "Y/C select" (local control of the Y/C camera inputs via Pin 1) and "CVBS select, connect via TTL in 3" (in addition to the local control of the CVBS camera inputs via Pin 1 and 2, connect and discon- nect of the line via TTL Pin 3).

5.5.2.3.3 Sub menu TITAN Micro 2M Enc., Line Panel

In this sub menu the data rate of the encoder can be set and the time slot for the bi-directional control channel has to be defined. Data rates of (1 ... 16) x 64-kbit/s can be chosen. To define the data rate the number of the first time slot and the number of time slots used for the video signal must be set. The coded video data can occupy 16 time slots of the 2-Mbit/s/T1 signal. The operating modes "Standard" and "Data+Crtl insert" should be selected. As address number 0 should be set. As a further item the interface parameters can be selected.

If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return.

Figure 18: Sub menu TITAN Micro 2M Enc., Line Panel, E1
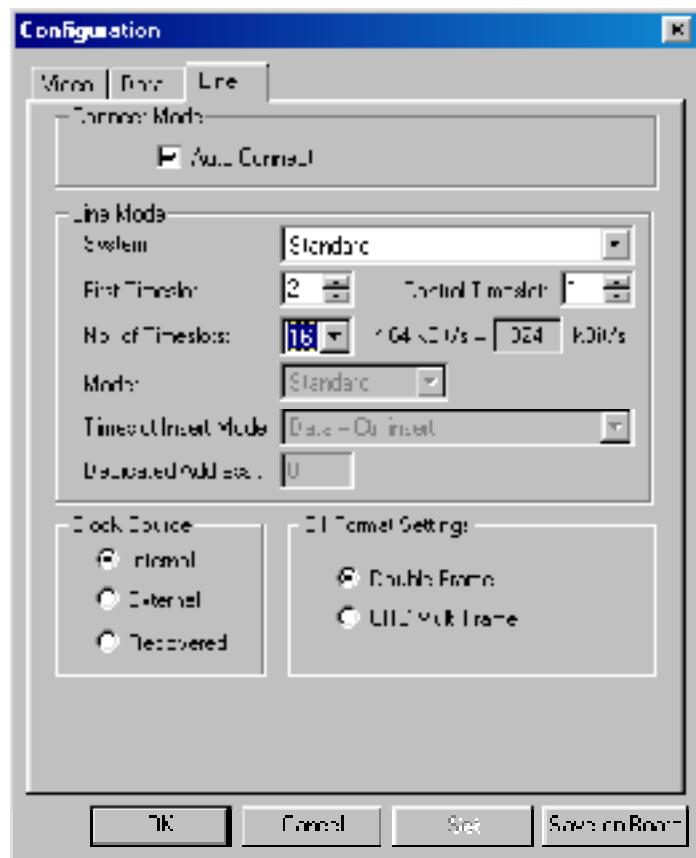
Figure 19: Sub menu TITAN Micro 2M Enc., Line Panel, T1
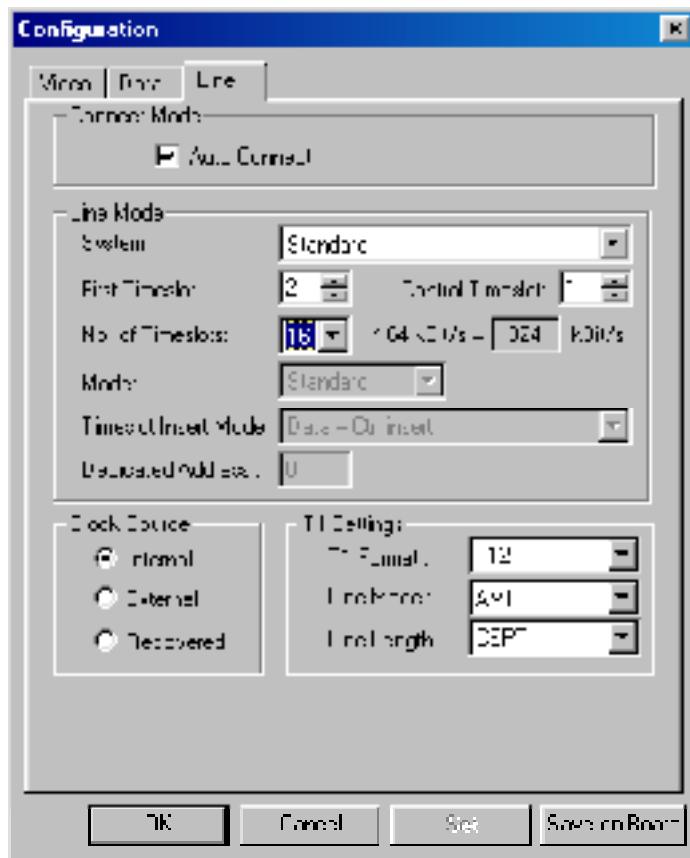
5.5.2.4 Sub menu TITAN Micro 2M Decoder

There can be displayed 4 different panels: Video, Data, Line and OSD.
***The configuration will be saved selecting the button "Save on Board".***
The commands "Set" and "OK" only cause the transmission of the configuration from the PC to the TITAN Micro but does not store the configuration on the TITAN Micro. The command "OK" also closes the window of the PC software.
If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return

5.5.2.4.1 Sub menu TITAN Micro 2M Dec., Video Panel

The video output combinations Y/C+CVBS or RGBSyn+CVBS can be selected. Via remote control the video inputs of the Encoder can be configured (CVBS 1...4 or Y/C 1, 2) and the quality of the coded video picture can be defined (sharpness versus motion). The video standard can be selected as PAL or NTSC. The camera inputs can be switched in a cyclic mode activating the field "Cyclic Camera Switch". The switching period can be defined in field "Switch Time".

Figure 20: Sub menu TITAN Micro 2M Dec., Video Panel
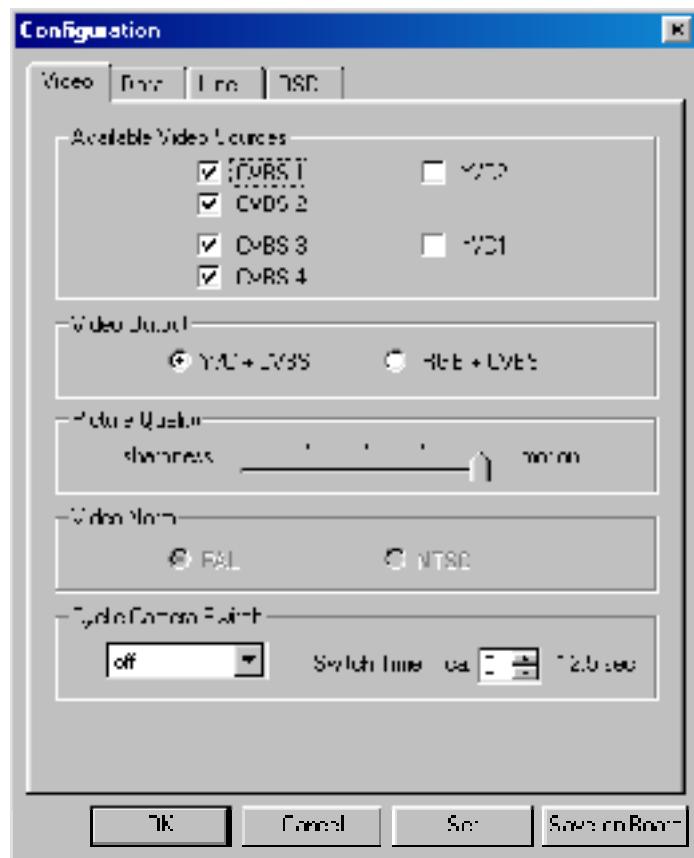
5.5.2.4.2 Sub menu TITAN Micro 2M Dec., Data Panel

The LSD data rate of the bi-directional data channel between the decoder and encoder can be set. Available data rates are 1200 Baud, 2400 Baud, 4800 Baud or 9600 Baud. The TTL interface can be configured in 4 different modes for remote control of the Encoder. For this purpose the following settings of the "TTL I/O Mode" field are possible: "off" (no function), "transparent" (transparent transmission of the status of the TTL inputs at the Decoder to the Encoder), "CVBS select" (remote control of the CVBS camera inputs via Pin 1 and 2) or "Y/C select" (remote control of the Y/C camera inputs via Pin 1) and "CVBS select, connect via TTL in 3" (in addition to the remote control of the CVBS camera inputs via Pin 1 and 2, local connect and disconnect of the line via TTL Pin 3).

Figure 21: Sub menu TITAN Micro 2M Dec., Data Panel
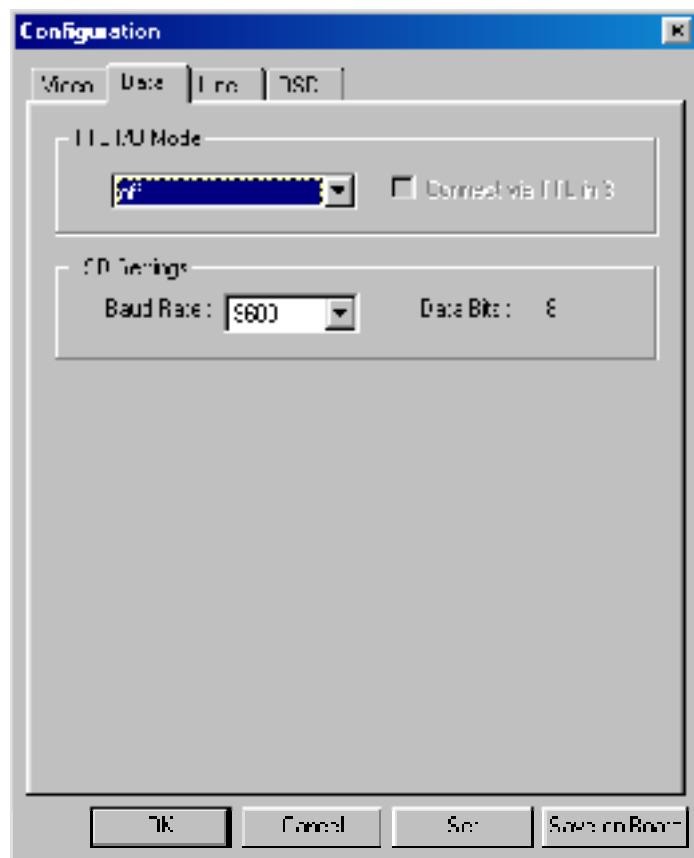
5.5.2.4.3 Sub menu TITAN Micro 2M Dec., Line Panel

In this sub menu the data rate of the encoder can be set and the time slot for the bi-directional control channel has to be defined. Data rates of (1 ... 16) x 64-kbit/s can be chosen. To define the data rate the number of the first time slot and the number of time slots used for the video signal must be set. The coded video data can occupy 16 time slots of the 2-Mbit/s/T1 signal. The operating modes "Standard" and "Data+Crtl insert" should be selected. As address number 0 should be set.

Remark:

The configuration of the decoder has to be the same as of the encoder.

As a further item the interface parameters can be selected.

If the "Auto Connect" button is selected the system will automatic reconnect after power failure and power return.

**Figure 22: Sub menu TITAN Micro 2M Dec., Line Panel, E1**
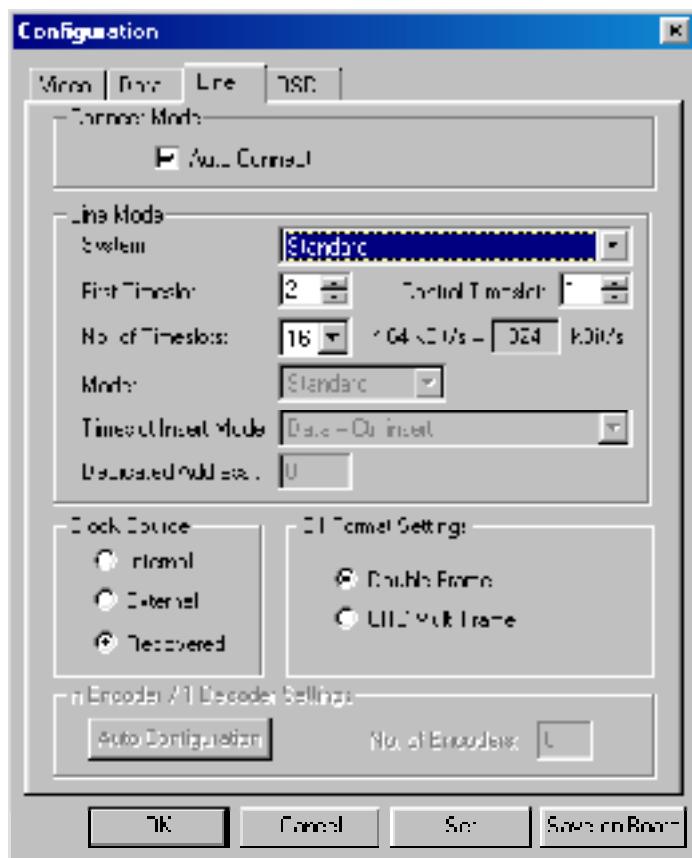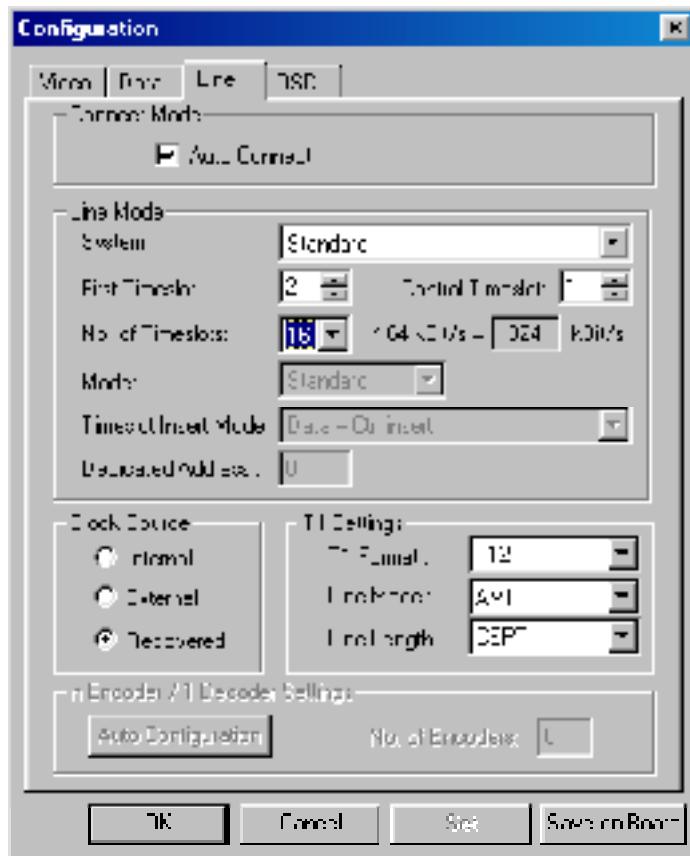
5.5.2.4.4 Sub menu TITAN Micro 2M Dec., OSD Panel

Field "Time/Date" allows the selection of the clock function and also the setting of the clock. In the field "OSD Mode" fixed symbols and self defined characters for the selected camera can be displayed in the decoded picture. Also strings can be defined by the user and can be indicated in the decoded picture.

Figure 24: Sub menu TITAN Micro 2M Dec., OSD Panel
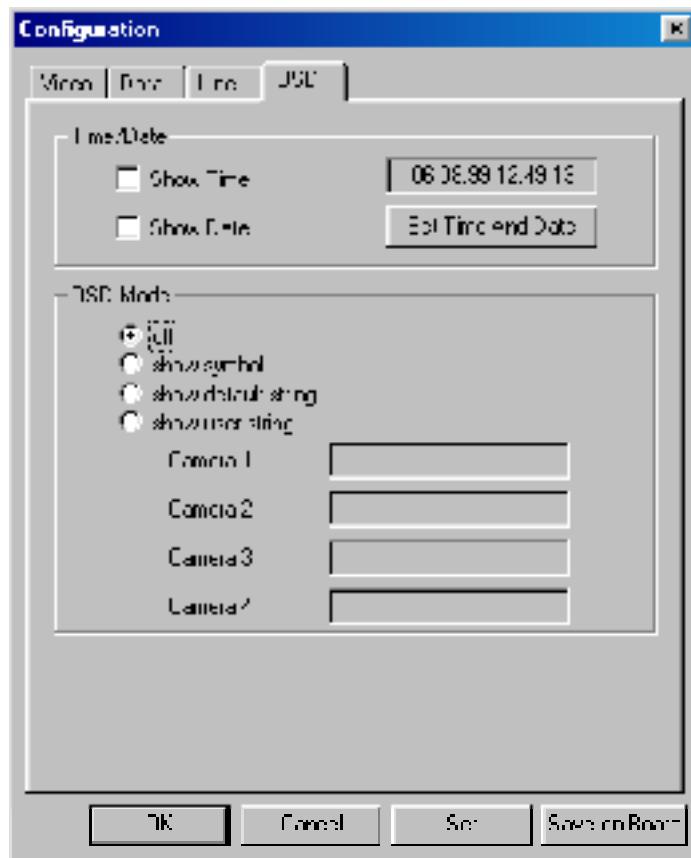
5.5.3 Sub menu Two Button Mode

Via selection of this command the items Connect and Disconnect can be con-
figured as one or two button display.

5.5.4 Sub menu System Panel

The sub menu *System Panel* allows simple communication with TITAN *Micro*.
For control purpose string commands can be entered.

5.5.5 Sub menu Software Download

The sub menu Software Download is used to copy new software from the PC
to the TITAN *Micro* units.
After selection of the sub menu in the field "Ctl File Name" one of the following
software packages will be displayed in accordance to the stored software:
- MDSP.CTL   Processor Software: Empty, no software stored
- MWENC.CTL   Encoder Software: Encoder software stored
- MWDEC.CTL   Decoder Software: Decoder Software stored

The button "Browse" allows the selection of the drives of the files for the
software download.
Start the transmission of the software to the TITAN *Micro* by selecting the
button "Start Download". During the software download a few files will be up-

dated whereas the command "Current File" indicates how much of the software of the actual file has been loaded and the command "All" indicates how much of the software of the complete number of files has been loaded. In the white area remarks will be indicated in relation to the stored files. The button "OK" closes the window.

Figure 25: Sub menu Software Download
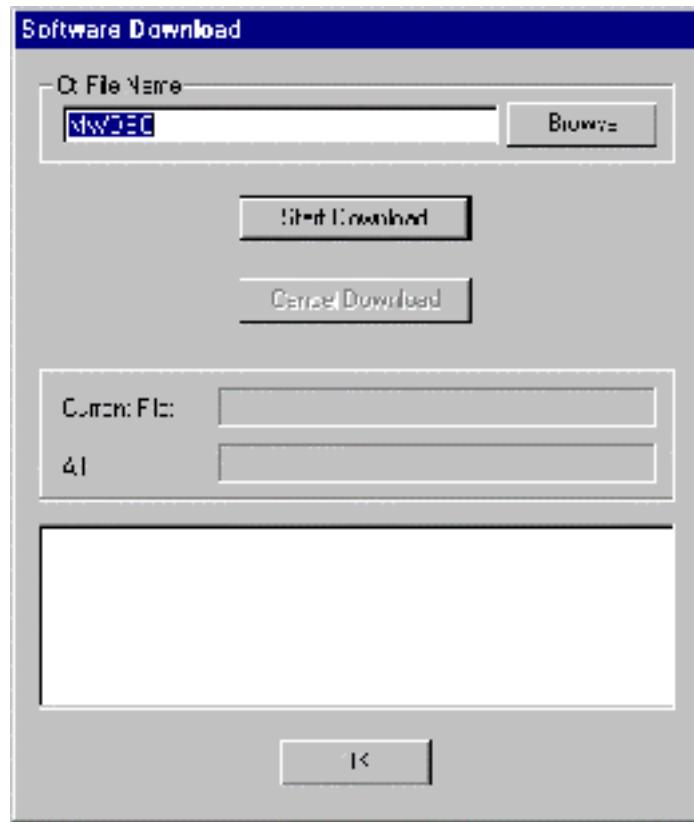
5.6 Menu Help

Company address and installed software version will be indicated in the menu help.

Figure 26: Sub menu Help

6 TITAN MICRO 2M DUAL MODE

To use the complete capacity of the 2-Mbit/s data stream, it is possible to interconnect two TITAN Micro 2M units in a daisy chain mode. The 2-Mbit/s signal of the first TITAN Micro 2M can be routed through the second TITAN Micro 2M.

Each TITAN Micro 2M consists of an individual bi-directional data channel for e.g. remote camera control.

6.1 Configuration of the TITAN Micro 2M Encoder units

In the following the line panels of the two TITAN Micro 2M Encoder 1 and 2 are described. The time slot allocation of both units is described in the two line panels. In the case there is used a synchronous network also Encoder 1 must be set to „Clock Source" „Recovered".

Figure 27: Sub menu TITAN Micro 2M Enc.1, Line Panel
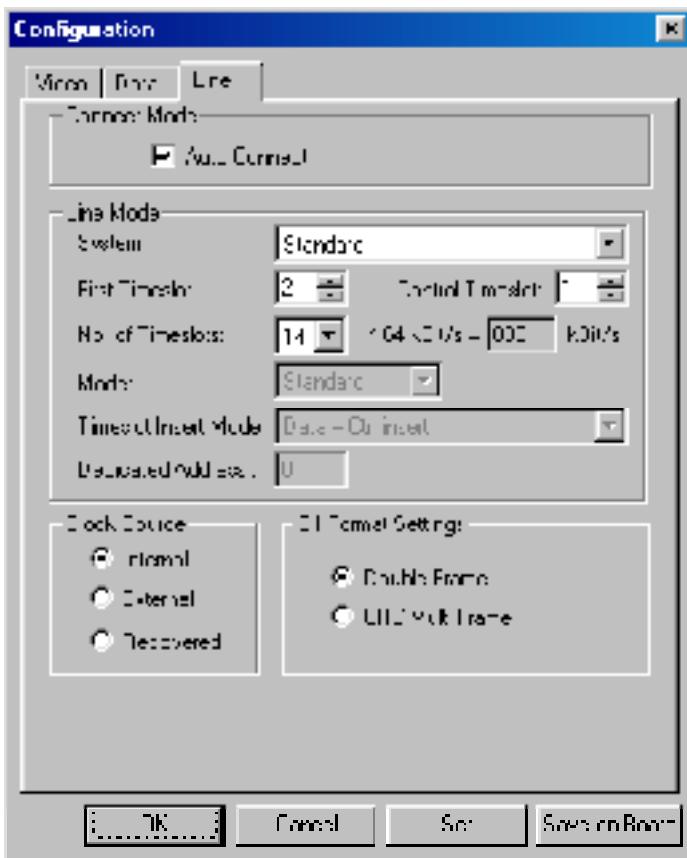
Figure 28: Sub menu TITAN Micro 2M Enc.2, Line Panel
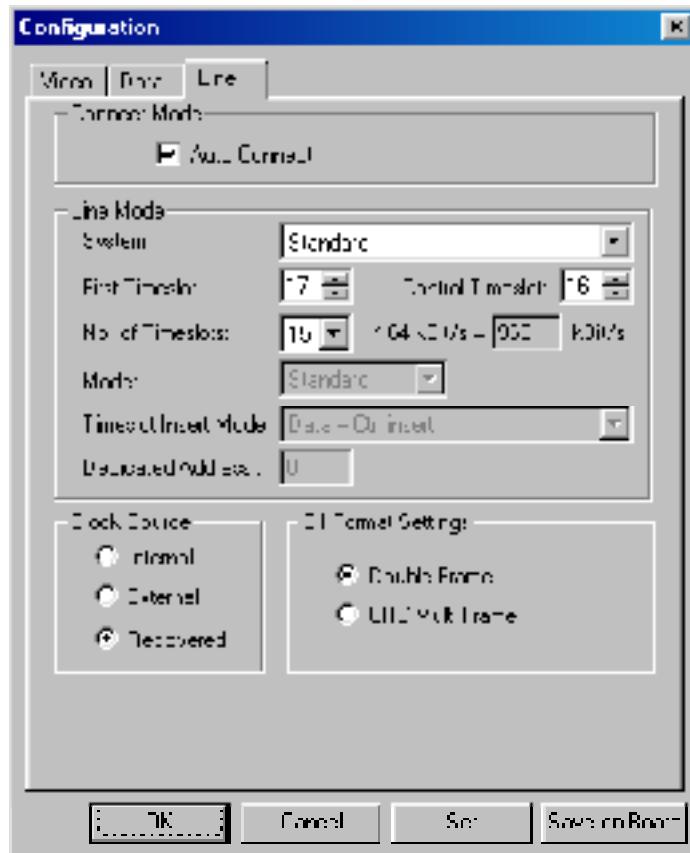
6.2 Configuration of the TITAN Micro Decoder units

In the following the line panels of the two TITAN Micro 2M Decoder 1 and 2 are described. The time slot allocation of both units is described in the two line panels.

Remark:

The configuration of the decoder units must be the same as of the encoder units.

Figure 29: Sub menu TITAN Micro 2M Dec.1, Line Panel
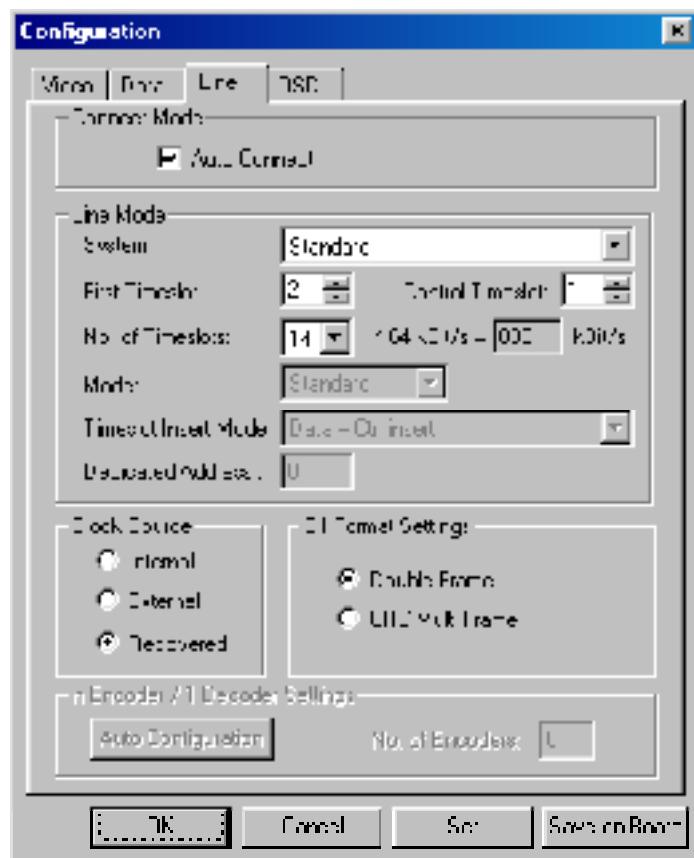
Figure 30: Sub menu TITAN Micro 2M Dec.2, Line Panel
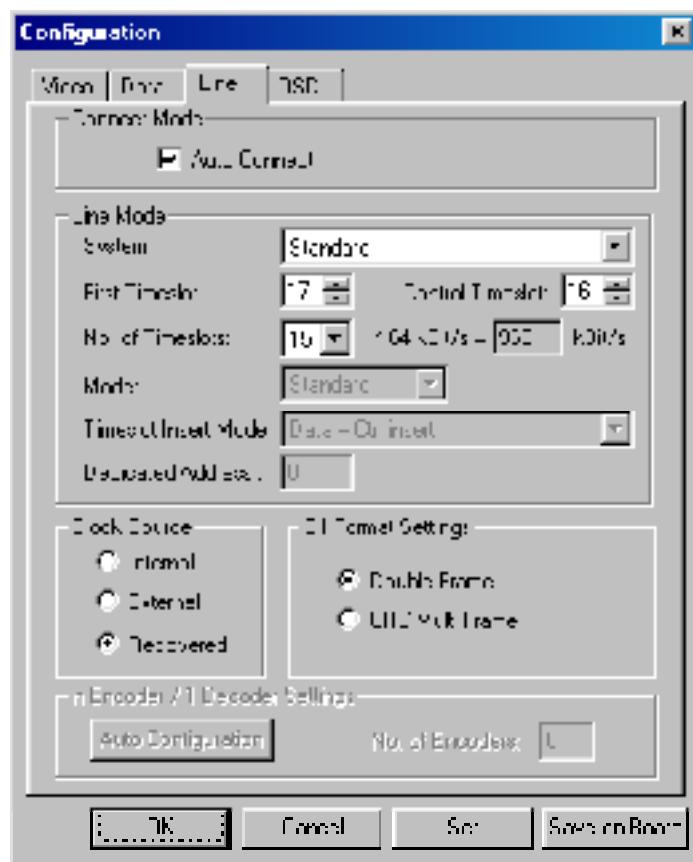
7 INTERFACES

The connectors of the interfaces are at the rear side of the unit.
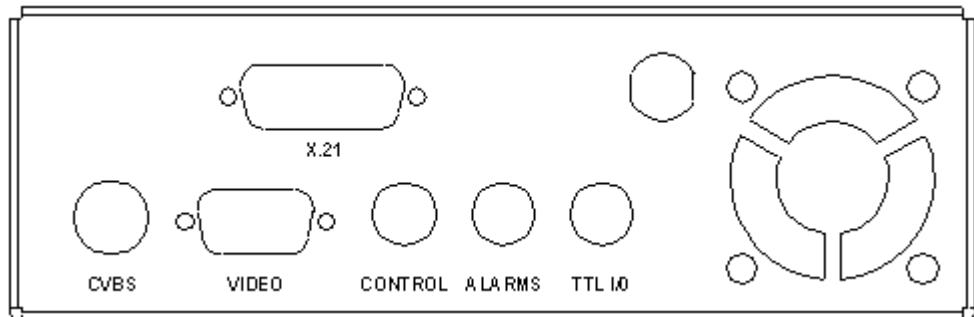
Figure 31: Rear view of TITAN *Micro* X.21/V.35
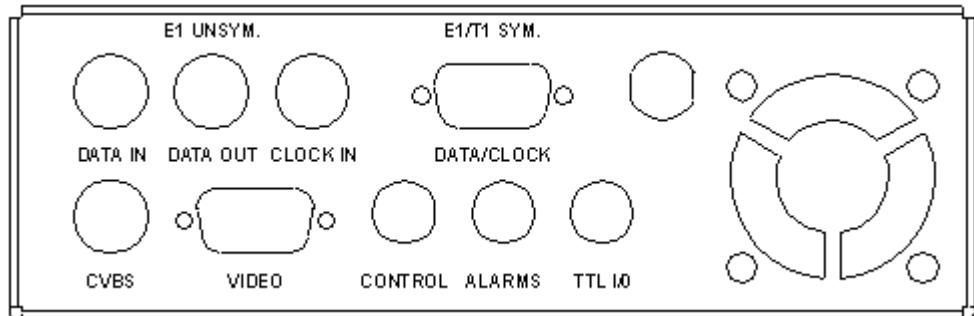
Figure 32: Rear view of TITAN *Micro* 2M

7.1 Video interfaces

TITAN *Micro* contains of 2 connectors for its video interfaces, a BNC socket and a 15 pin D-Submin socket with 3 rows (VGA socket).

7.1.1 Video encoder

The video inputs are configurable in five modes. One socket is assigned to different signals, depending on the mode. The socket assignment for the various modes is shown in TABLE 6.1.

TABLE 6.1: VIDEO INPUTS							
CVBS (BNC)	**VIDEO (D SubMIn)**						
CVBS	**Pin 1**	**Pin 2**	**Pin 3**	**Pin 4**	**Pin 5**	**Pin 6 ...10**	**Pin 11**
CVBS1	-	-	-	-	nc	GND	+12V
CVBS 1	-	CVBS3	CVBS2	CVBS4	nc	GND	+12V
-	CVBS1	CVBS3	CVBS2	CVBS4	nc	GND	+12V
CVBS1	-	Y1	CVBS2	C1	nc	GND	+12V
-	CVBS1	Y1	CVBS2	C1	nc	GND	+12V
-	Y2	CVBS3	C2	CVBS4	nc	GND	+12V
-	Y2	Y1	C2	C1	nc	GND	+12V

TITAN *Micro* offers in addition to the video inputs 4 Genlock outputs which are available on pins 12 ... 15 (Genlock 1 ...4) of socket " VIDEO".

7.1.2 Video decoder

The video decoder contains of a CVBS, Y/C or RGB interface with separate Sync. The socket assignment for the two modes is shown in TABLE 6.2.

TABLE 6.2: VIDEO OUTPUTS								
CVBS(BNC)	VIDEO (D Sub Min)							
CVBS	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6 ...10	Pin 11	Pin 12,15
CVBS	-	Y	-	C	-	GND	+12V	nc
-	CVBS	Y	-	C	-	GND	+12V	nc
CVBS	-	G	B	R	Sync	GND	+12V	nc
-	CVBS	G	B	R	Sync	GND	+12V	nc

The video decoder offers also a Genlock input and output.
The Genlock input is available at pin 13 of socket "VIDEO" and the Genlock output is available at pin 14 of socket "VIDEO".

Remark:
The Genlock inputs and outputs as well as the video outputs Y/C and RGB Sync are not available in software version1.0.

7.1.3 Control interface

For the Control interface there is a PC adapter cable included in the delivery. The socket assignment of the 8 pin Mini DIN socket is shown inTABLE 6.3.

TABLE 6.3: CONTROL INTERFACE								
Pin	1	2	3	4	5	6	7	8
Funcion	nc	nc	DAT RxD	GND	DAT TxD	nc	CTL RxD	CTL TxD

7.2 Alarm interface

To the socket "ALARMS" there can be connected or delivered alarm signals. The socket assignment of the 8 pin Mini DIN socket is shown in TABLE 6.4 .

TABLE 6.4: ALARMS								
Pin	1	2	3	4	5	6	7	8
Function	GND	+5V	Alarm out	TTL in 4	Alarm in +	Alarm out	Alarm in -	TTL out 4

- Alarm out : pin 3 to pin 6 connected, if an alarm is delivered
  (electrically decoupled contact)

- Alarm in   : +5V between pin 5 and pin 7

7.3 TTL I/O interface

The socket TTL I/O allows the connection of TTL signals and also TTL signals can be delivered. The socket assignment of the 8 pin Mini DIN socket is shown in TABLE 6.5.

TABLE 6.5: TTL I/O								
Pin	1	2	3	4	5	6	7	8
Function	GND	+5V	TTL in 1	TTL in 2	TTL in 3	TTL out 1	TTL out 2	TTL out 3

7.4 X.21 line interface

The X.21 interface is labelled with "X.21" . It is implemented as a DTE. The pin assignment of the connector is shown in TABLE 6.6.

TABLE 6.6: X.21 LINE INTERFACE				
Connect.	Signal	Description	Characteristic	
1	SHIELD	Shield	Type:	DTE
2	Ta	Transmit a	Level:	V.11, symmetrical
3	Ca	Control a		
4	Ra	Receive a	Data rate:	64 till
5	Ia	Indicate a		1024- kbit/s
6	Sa	Signal Element Timing a	Range	100 m
7	Ba	not connected		
8	GND	Ground		
9	Tb	Transmit b		
10	Cb	Control b		
11	Rb	Receive b		
12	Ib	Indicate b		
13	Sb	Signal Element Timing b		
14	Bb	not connected		
15		not used		

7.5 E1 (2-Mbit/s) line interface

The E1 (2-Mbit/s) line interface can be configured as 120 Ohm symmetrical or 75 Ohm unsymmetrical interface. The selection has to be done via jumpers (11jumper) on the E1/T1 line interface board:

- 120 Ohm symmetrical: all 11 jumpers in position to the internal connectors
- 75 Ohm unsymmetrical: all 11 jumpers in the middle position

The TITAN Micro 2M-40dB Encoder Decoder units consist of a special E1 (2-Mbit/s) line interface circuit where a 6dB or 40dB level interface can be chosen. The selection can be done by a further row of jumpers (4 jumpers) on the E1/T1 line interface board:

- 6 dB level: all 4 jumpers in position to the internal connectors
- 40 dB level: all 4 jumpers in position to the external connectors

7.5.1 Symmetrical E1 (2-Mbit/s) line interface

The 120 Ohm symmetrical E1 (2-Mbit/s) line interface is available at a 9 pin SUB-D socket, which is labelled with "E1/T1 SYM.". The pin assignment of the socket is shown in TABLE 6.7.

TABLE 6.7: E1 (2-Mbit/s) LINE INTERFACE symmetrical				
Connect.	**Signal**	**Description**	**Electrical characteristics**	
1	Shield	Shield	Amplitude:	3 Vss according
2	RXD a	Data in a		to G.703
3	TXD a	Data out a	Impedance:	120 Ohm sym.
4	RXCLK a	Clock in a	Range	
5	TXCLKa	Clock out a	at 6dB level:	100 m
6	RXD b	Data in b	at 40 dB level:	2000 m
7	TXDb	Data out b	Clock amplitude	
8	RXCLKb	Clock in b	Input:	0,5 till 1,9 Vop
9	TXCLKb	Clock out b	Output:	1,5 Vop

7.5.2 Unsymmetrical E1 (2-Mbit/s) line interface

The 75 Ohm unsymmetrical E1 (2-Mbit/s) line interface is labelled with "E1 UNSYM." and available at 3 BNC sockets.

TABLE 6.8: E1 (2-Mbit/s) LINE INTERFACE, BNC socket " DATA IN"			
Connect.	**Signal**	**Electrical characteristics**	
1 (inner conductor)	Data F1 in	Amplitude:	3 Vss as perG.703
2 (outer conductor)	GND	Impedance:	75 Ohm unsym.
		Range	
		at 6dB level:	100 m
		at 40 dB level:	2000 m

TABLE 6.9: E1 (2-Mbit/s) LINE INTERFACE, BNC Socket " DATA OUT"			
Connect.	**Signal**	**Electrical characteristics**	
1 (inner conductor)	Data F1 Out	Amplitude:	3 Vss as per G.703
2 (outer conductor)	GND	Impedance:	75 Ohm unsym.
		Range	
		at 6dB level:	100 m
		at 40 dB level:	2000 m

TABLE 6.10: E1 (2-Mbit/s) LINE INTERFACE, BNC Socket " CLOCK IN"			
Connect.	**Signal**	**Electrical characteristics**	
1 (inner conductor)	Data T3 In	Amplitude:	0,5 till 1,9 Vop
2 (outer conductor)	GND	Impedance:	75 Ohm unsym.
		Range:	100 m

7.6 T1 line interface

The T1 (1,544-Mbit/s) line interface exists only as a 100 Ohm symmetrical interface. The selection of the T1 line interface has to be done by jumpers (11 jumpers) on the E1/T1 line interface:

- T1, 100 Ohm symmetrical: all 11 jumpers in position to the external
                                 connectors

The 100 Ohm symmetrical T1 (1,544-Mbit/s) line interface is available at a 9 pin SUB-D socket, which is labelled with "E1/T1 SYM. The pin assignment of the socket is shown in TABLE 6.11.

TABLE 6.11: T1 (1,544-Mbit/s) LINE INTERFACE symmetrical				
Connect.	Signal	Description	Electrical characteristics	
1	Shield	Shield	Amplitude:	3 Vss as per
2	RXD a	Data in a		G.703
3	TXD a	Data out a	Impedance:	100 Ohm sym.
4	RXCLK a	Clock in a	Range	
5	TXCLKa	Clock out a	at 6dB level:	100 m
6	RXD b	Data in b	at 40 dB level:	2000 m
7	TXDb	Data out b	Clock amplitude	
8	RXCLKb	Clock in b	Input:	0,5 till 1,9 Vop
9	TXCLKb	Clock out b	Output:	1,5 Vop

7.7 V.35 line interface

The V.35 interface is labelled with "V.35" . It is implemented as a DTE. The pin assignment of the connector is shown in TABLE 6.12.

TABLE 6.12: V.35 LINE INTERFACE				
Connect.	Signal	Description	Characteristic	
1	SHIELD	Shield	Type:	DTE
2	TxA	Transmit A	Level:	V.11, sym-
3	TxB	Transmit B		metrical
4	TxClkA	Transmit Clock A	Data rate:	64 till
5	TxClkB	Transmit Clock B		1024- kbit/s
6	DCD	Data Carrier Detect (in)	Range	100 m
7	GND	Ground		
8		not used		
9		not used		
10	RTS	Ready to send (output)		
11	RxClkB	Receive Clock B		
12	RxClkA	Receive Clock A		
13	RxB	Receive B		
14	RxA	Receive A		
15		not used		

8 REMOTE CONTROL FUNCTIONS

The TITAN Micro Encoder unit can be remotely configured from the Decoder unit over the line connection back channel (X.21 or V.35 or 2-Mbit/s). Further, the settings of the TTL inputs at the Decoder can be transmitted to the Encoder where they are available as switching functions. Additionally, a transparent, uni-directional data channel in the X.21 and V.35 units or a bi-directional data channel in the 2M units is available.

8.1 Remote Configuration of the Encoder

Using Windows PC software, the following functions can be remotely controlled from the Decoder over the line connection back channel.

- Selection of camera source for the Encoder (CVBS1 ... CVBS4, or Y/C1, Y/C2). For this, the camera source is configured in the "Available Video Sources" field of the video panel. The camera selection can be made from the Main Menu panel.
  CAUTION: The same configuration of the video sources in the "Available Video Sources" field of the video panel in the Encoder and the Decoder is necessary.
- Selection of the "First Timeslot", "Control Timeslot" and "No. Of Timeslots" (n*64-kbit/s, n=1 ... 16) in the line panel Decoder.
- Selection of the coding quality of the Encoder via the "Picture Quality" field of the video panel of the Decoder (Sharpness versus Motion).

8.2 Transmission of the Decoder TTL Input

Over the line connection back channel, the status of the TTL inputs at the Decoder can be transmitted to the Encoder.
CAUTION: At the Encoder mode "TTL transparent" has to be configured in the "TTL I/O Mode" field.
Four different Modes are selectable at the Decoder:

- TTL off: Remote control function de-activated
- TTL transparent: Transparent transmission of the status of the TTL inputs at the Decoder to the Encoder
- CVBS select: From the designated CVBS camera sources, the CVBS camera inputs CVBS1 ... CVBS4 can be selected via TTL inputs 1 and 2.

TTL1	TTL2	Camera Input
open	open	CVBS1
GND	open	CVBS2
open	GND	CVBS3
GND	GND	CVBS4

  The status of TTL inputs 3 and 4 are transmitted transparently from the Decoder to the Encoder.
- Y/C select: From the designated Y/C camera sources, the Y/C camera inputs Y/C1, Y/C2 can be selected via TTL input 1.

TTL1	Camera Input
open	Y/C1
GND	Y/C2

The status of TTL inputs 3 and 4 are transmitted transparently from the Decoder to the Encoder.

- CVBS select/ con. via TTL in 3

Except for the functionality of the TTL 3 input, this mode is identical to "CVBS select". Over the TTL 3 input a "connect" and "disconnect" of the TITAN Micro equipment can be made.

<u>TTL3</u>   <u>Function</u>
open   connect
GND   disconnect

8.3 Data Channel

The Data channel in the **TITAN Micro X.21 and V.35 is available as a uni-directional, transparent, channel from Decoder to Encoder** and the interface on the equipment is labelled "CONTROL". However the Data channel in the **TITAN Micro 2M is realised as a bi-directional transparent channel between Decoder and Encoder**. In the Windows PC software, the configuration is shown in the "LSD" field. The interfaces are implemented on the Encoder and Decoder as 8 data bits, RS232C interfaces. The following data rates can be selected:

- 1200-bit/s
- 2400-bit/s
- 4800-bit/s
- 9600-bit/s

Die CONTROL interface connector is actually two RS232 interfaces.

- PC control interface: Pin 7 (CTL/RxD)
                                                     Pin 8 (CTL/TxD)
- Data channel interface: Pin 3 (DAT/RxD)
                                                     Pin 5 (DAT/TxD)

A common GND is available at pin 4.

9 CONFIGURATION OF THE ALARM INTER-

FACE

The TITAN Micro 2M and the TITAN Micro 2M-40dB units can provide an alarm signal at their alarm interface (Alarm out, Pin 3 and 6). The alarm conditions can individually configured by the user. To activate the alarm interface a hexadecimal value has to be calculated using the bit positions of the following alarm conditions.

- Bit 0:   Local D alarm
- Bit 1   Remote D alarm
- Bit 2:   No clock
- Bit 3:   No sync
- Bit 4:   Local N alarm
- Bit 5:   Remote N alarm
- Bit 6:   AIS
- Bit 7:   No signal

Using the Windows PC software the calculated hexadecimal value can be entered into the system panel.

Relais 1 <hexadecimal value>   pre-configuration
Relais(space)1(space)<hexadecimal value>
Sob   activating and storing
(Save on board)

Example:
Configuration of the alarm interface using the following 3 alarm conditions:
- Bit 3:   No sync
- Bit 6:   AIS
- Bit 7:   No signal

The following commands have to be entered into the system panel

Relais 1 c8   pre-configuration
Relais(space)1(space)c8
Sob   activating and storing
(Save on board)

The **deactivation of the alarm interface** can be done entering the following commands

Relais 1 0   pre-configuration
Relais(space)1(space)0
Sob   activating and storing
(Save on board)

10 TROUBLE SHOOTING

If the system indicates a fault please make the following checks to get the system running or allocate the fault .

Fault	Possible reason
• After putting the system into operation the 3 LEDs do not light up for approximately 1 second.	⇒ Please check whether the plug top power supply unit is plugged in or mains voltage is missing.
• The system is in operation but Windows application software can not recognise the system.	⇒ Is the delivered interface cable used for the interconnection of PC and TITAN *Micro* (CONTROL)?
	⇒ Please check whether the delivered interface cable is used (8 pin Mini DIN to 9 pin D-Submin)?
	⇒ Is the right COM-Port of the PC selected (see chapter 5.5.1)?
	⇒ Is the right Baud rate selected (19200 Bd, see Chapter 5.5.1)?
• No incomming signal at the decoder side	⇒ Is LED "Connect" at encoder and decoder lighting?
	⇒ Is a camera connected to the encoder?
	⇒ Is the right video input selected?